The North Carolina

School of Science

and Mathematics

Course Catalog 1991-92

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THE NORTH CAROLINA SCHOOL OF SCIENCE AND MATHEMATICS

CATALOG 1991-92

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INTRODUCTION

The course offerings described in the following pages have been developed for the 1991-1992 school year. They have been designed to provide both depth and breadth in the instructional program. An effort is made to accommodate the student's individual interests, with final decisions on any year's course offerings based on staff availability and satisfaction of minimum enrollment requirements.

The first consideration in building each student's course of study is to ensure a thorough grounding in mathematical, scientific, and communications skills and concepts. Students are urged to select an advanced sequence in at least one discipline in science and/or mathematics and also to sample other areas of study through their choice of electives. The objective is for students to learn enough about a variety of academic disciplines, in mathematics and the sciences and in other fields, to become informed decision makers and competent leaders in the technological world of the twenty-first century.

In order to address the special needs, interests, and learning styles of a talented student population, the following study options and special programs are provided: Independent Study, Individualized Study, and Seminar Study. Mentorship placements with faculty or other professional personnel in neighboring universities, colleges, museums, institutes, laboratories, or industries are arranged and supervised by the Mentorship Program Coordinator, who is a member of the instructional staff.

The graduation requirements listed on the final pages specify that English and mathematics must be included in every student's program each semester and that juniors must be enrolled in two sciences and a foreign language. American history and literature are also required in the junior year. The computer literacy requirement is met through the curricular design of mathematics and history courses. Each student is required to register for a minimum of five courses per semester.

Because of the diverse and talented nature of the student body, special arrangements are made to exempt some students from introductory level courses through testing. These tests are arranged through consultation with the appropriate academic departments after arrival on campus at the start of the junior year. Specific guidelines about requirements for replacing exempted courses are published in The NCSSM Handbook.

Grade reports are issued to students and parents on a quarterly basis. Supplementary evaluations are sent when appropriate. The system of class rank is not used, since the school population is highly motivated and selected through a competitive admissions process. The following letter evaluation system is used and interpreted on school documents:

A Outstanding achievement
B Superior, meets all course requirements
C Acceptable, minimally meets course requirements
D Unsatisfactory, no NCSSM credit
I Incomplete
S Satisfactory
U Unsatisfactory

Semester courses earn one-half unit of credit and year courses one full unit of credit. Partial credit is not granted. Additional information on registration procedures, including guidelines for modifying a course schedule after the beginning of the academic year, is published in The NCSSM Handbook.

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

Graduation Requirements in Mathematics

Each student must be enrolled in a mathematics course for the duration of each semester of study at NCSSM. Each student must successfully complete one unit of mathematics each year for a total of two units of mathematics graduation credit. Unless a student was placed in a higher level of mathematics upon entry to NCSSM, one of these units must be in MA120 Contemporary Precalculus through Applications. Courses on the 200 level cannot be used for mathematics graduation credit.

Placement

Juniors are placed in the course best suited for them as determined by the Mathematics Department based on placement tests, previous instruction, and interviews. Placement of seniors is determined by the mathematics courses they complete as juniors and by their performance in those courses. The department recognizes the individual differences that need to be considered as students are placed in senior level courses.

Course Offerings

MA110 ALGEBRA 2. One year (1 unit of credit).

This course is designed for those students who have not yet taken Algebra 2. The topics covered in the course include radicals, factoring and graphing polynomials, rational expressions, solution of linear and quadratic equations and inequalities, solutions to systems of equations, introduction to functions (including exponential, logarithmic, and trigonometric functions), conic sections, complex numbers, sequences, and series. Emphasis is placed on mathematics as a tool for problem solving and simple mathematical modeling.

MA112 ALGEBRA 3. One year (1 unit of credit).

Prerequisite: Algebra 2

This junior level course reviews and extends the concepts of Algebra 2 through the use of mathematical models involving functions. The course includes a comprehensive survey of linear, quadratic, exponential, and logarithmic functions. The instructor supplements this core with the selection of topics from polynomial and rational functions, systems of equations, complex numbers, sequences and series, and elementary probability and statistics. An effort is made throughout to motivate work on algebraic manipulations through the use of real-life situations.

MA120 CONTEMPORARY PRECALCULUS THROUGH APPLICATIONS. One year (1 unit of credit).

Prerequisite: Algebra 2 or Algebra 3

Mathematics is approached in innovative ways using the computer and calculator as tools. Applications drive the need to develop elementary functions that serve as a bridge between mathematics and the real world it models. The elementary functions studied are polynomial, exponential, logarithmic, and trigonometric. Additional techniques from matrices, probability, exploratory data analysis, algorithms, and statistics aid in striving to describe real world phenomena. A graphical approach is emphasized throughout the course.

MA125 CONTEMPORARY PRECALCULUS THROUGH APPLICATIONS WITH TOPICS. One year (1 unit of credit).

Prerequisite: Algebra 2 or Algebra 3

The topics and ideas of MA120 Contemporary Precalculus through Applications are presented in greater depth and at a faster pace. Some topics are explored more extensively and additional topics are selected to supplement the course materials.

MA127 FUNCTIONS. One semester (1/2 unit of credit).

Prerequisite: MA120 Contemporary Precalculus through Applications (or MA125) and permission of the Mathematics Department

This course reviews and extends the functions concepts covered in Contemporary Precalculus through Applications. Special emphasis will be placed on the properties of exponential and trigonometric functions. Other topics and the time spent on them will vary depending on student needs.

MA217 INTRODUCTION TO COMPUTING. One semester (1/2 unit of credit).

Students learn to use the computer as a tool for learning, communication, and problem-solving. Powerful software such as spreadsheets, MathCAD, and symbolic manipulators are investigated. Word processing applications are reviewed and expanded. Students learn the fundamentals of programming by writing elementary programs in TrueBASIC. The course is graded Satisfactory/Unsatisfactory.

MA220 PROGRAMMING IN PASCAL. One semester (1/2 unit of credit).

The methodology of structured programming, especially stepwise refinement and top-down design, is emphasized through the use of the Pascal language. Language-independent features of Pascal are introduced, including program efficiency, algorithms, data structures, modular design, and documentation. No prior programming experience is necessary.

MA222 ALGORITHMS AND DATA STRUCTURES.
One semester (1/2 unit of credit).

Prerequisite: MA220 Programming in Pascal or permission of the Mathematics Department

Based on the introductory work of Programming in Pascal, more advanced features of algorithms and data structures are studied with implementation through the Pascal language. Algorithms are studied with emphasis on iteration, recursion, divide-and-conquer, and efficiency. Data structures studied include linear data structures, tree structures, and other linked structures. Students successfully completing this course may elect to take the AP Computer Science Level AB Examination. The concepts in this course form the basis for additional study in computer science.

MA300 SURVEY OF FINITE MATHEMATICS. One semester (1/2 unit of credit).

Corequisite: MA120 Contemporary Precalculus through Applications (or MA125) or permission of the Mathematics Department

This course offers an overview of many applications of mathematics in the social and management sciences, also known as the mathematics of human decision-making. Topics included are selected from the following: fair division of resources and costs, voting methods, apportionment of legislative bodies, power of voting coalitions, combinatorics, the mathematics of financial institutions, linear programming, and mathematical models using matrices. Students are expected to be involved in formulating problems, applying the appropriate mathematics to find a solution, and evaluating the solution. Computers and calculators are used frequently as computational and modeling aids.

MA302 NUMBER THEORY. One semester (1/2 unit of credit).

Prerequisite: MA120 Contemporary Precalculus through Applications (or MA125) or permission of the Mathematics Department

Selected topics from elementary number theory are studied. They include divisibility properties of integers, special properties of prime numbers, congruences, Diophantine equations, Euler's Phi function, and some applications to such fields as cryptography. Students with programming experience are encouraged to use this tool to investigate some of the ideas presented in the course. Students are encouraged to consider specific examples and then make a generalization. The concept of proof is developed over the semester. This course may not be offered every year.

MA312 STATISTICS. One semester (1/2 unit of credit).

Prerequisite: MA120 Contemporary Precalculus through Applications (or MA125) or permission of the Mathematics Department

This course is designed to teach students to think about problems from a statistical point of view. Students are introduced to Exploratory Data Analysis and topics in experimental design, as well as to traditional descriptive and inferential statistics. Throughout the course, students use Minitab, a statistical computing system, and learn how statistics is used in education, political science, economics, medicine, and other fields. A final project requires each student to design an experiment or survey, carry out the process involved, and analyze the results.

MA314 STATISTICS WITH TOPICS. One semester (1/2 unit of credit).

Prerequisite: Permission of the Mathematics Department

This course is a faster paced and more in-depth study of the topics in MA312 Statistics. More emphasis is placed on the development of the mathematical underpinnings and theory of statistics. Additional topics are selected to supplement the course. This course may not be offered every year.

MA317 CALCULUS OF A SINGLE VARIABLE 1. One semester (1/2 unit of credit).

Prerequisite: A or B average in MA120 Contemporary Precalculus through Applications (or MA125) or permission of the Mathematics Department

This course provides a rigorous study of first semester college calculus. Topics include limits, differentiation, integration, curve sketching, and other applications. When appropriate, course content will implement the recent recommendations of the Mathematical Association of America and the Mathematical Sciences Education Board of the National Academy of Sciences for updating calculus.

MA318 CALCULUS OF A SINGLE VARIABLE 2. One semester (1/2 unit of credit).

Prerequisite: MA317 Calculus of a Single Variable 1

This course provides a rigorous study of second semester college calculus. Topics include physical applications, methods of integration, transcendental functions, indeterminate forms, improper integrals, infinite series, and an introduction to ordinary differential equations.

MA321 CALCULUS OF A SINGLE VARIABLE 1 WITH TOPICS.
One semester (1/2 unit of credit).

Prerequisite: Permission of the Mathematics Department

This course is a faster-paced and more in-depth study of the topics in MA317 Calculus of a Single Variable 1. Topics outside of the usual calculus curriculum are also included.

MA322 CALCULUS OF A SINGLE VARIABLE 2 WITH TOPICS.
One semester (1/2 unit of credit).

Prerequisite: Permission of the Mathematics Department

This course is a faster-paced and more in-depth study of the topics in MA318 Calculus of a Single Variable 2. Topics outside of the usual calculus curriculum are also included.

MA405 CALCULUS OF SEVERAL VARIABLES. One semester (1/2 unit of credit).

Prerequisite: MA318 Calculus of a Single Variable 2 (or MA322)

This course includes vector analysis, partial differentiation, multiple integrals, and line and surface integrals. Numerical approximations such as Simpson and trapezoidal methods for volumes, Taylor polynomials in two variables, and gradient search methods for constrained optimization are discussed.

MA410 TOPICS IN DISCRETE MATHEMATICS. One semester (1/2 unit of credit).

Prerequisite: Permission of the Mathematics Department

This course offers students an opportunity to study topics from outside the calculus-based sequence of mathematics. Content is drawn from the areas of analysis of algorithms, optimization, game theory, graph theory, and combinatorics. The topics covered are highly challenging, and both strong interest and talent in mathematics are required for success in the course. Students are required to research and present to the class a topic related to the content of this course. This course may not be offered every year.

MA415 TOPICS IN MODERN ALGEBRA AND APPLICATIONS.
One semester (1/2 unit of credit).

Prerequisite: Permission of the Mathematics Department

The purpose of this course is to give advanced students an opportunity to study topics not usually offered in a high school curriculum. The course covers topics such as groups, rings, fields, and integral domains. The particular topics and time spent on them varies with the instructor and student interest. Whenever possible, the course attempts to address the applications of algebraic structures to the sciences, business, statistics, and decision making. This course may not be offered every year.

MA417 MATHEMATICAL MODELING. One semester (1/2 unit of credit).

Prerequisite: Permission of the Mathematics Department

Advanced students are introduced to the creative and analytic aspects of modeling real-world phenomena. Models from engineering, biology, political science, management science, and everyday life are examined through a variety of techniques. When presented with a situation, students learn to propose, test, and revise an appropriate model. The course is project oriented and group work is required.

MA420-421 ADVANCED MATHEMATICAL TOPICS.
One semester (1/2 unit of credit).

Prerequisite: Permission of the Mathematics Department

This course offers an opportunity for students with an especially strong background in mathematics to pursue a rigorous study of a topic outside the standard curriculum. The topic chosen may be in mathematics or a mathematical study of another field. Students are expected to make formal presentations and to write a paper on the topic. This course is designed for students who have exhausted the other course offerings in mathematics or who wish to do independent research in mathematics.

MA425 FRACTALS AND CHAOS. One semester (1/2 unit of credit).

Prerequisite: Permission of the Mathematics Department and programming experience

This course will investigate phenomena that involve chaotic dynamics, modeling chaotic systems, how fractals are generated, applications of fractals to realistic phenomena, and the underlying mathematical theory of fractals and chaos. The related field of chaotic systems will also be studied. Fractals and chaotic phenomena defy classical mathematical descriptions, so the use of computer simulations will be an important part of the course. The topics in this course constitute recent discoveries in mathematics; therefore, students must possess the desire and the sophistication to work at the cutting edge of mathematical research. This course may not be offered every year.

DEPARTMENT OF SCIENCES

The Department of Sciences at the North Carolina School of Science and Mathematics ensures all students both an introductory level preparation in each of the basic sciences (biology, chemistry, and physics) and opportunities to pursue their particular interests by taking elective courses in areas of their choice. To meet graduation requirements in science, a student must complete three units of science while in residence at the North Carolina School of Science and Mathematics and show competence in each of the three sciences, either by passing introductory coursework equal to one unit of credit or by taking a test to be exempted from the first course. A student exempted from a science course must still complete three units of science credit at the North Carolina School of Science and Mathematics by adding either an advanced course or other science electives.

Biology

Graduation Requirement in Biology

The graduation requirement in biology may be fulfilled by a year-long biology course (BI250 Research in Biology or BI260 Survey of Advanced Biology); OR successful completion of a combination of semester biology courses in the 100 and/or 200 series totaling one unit of credit. (Note: The following electives cannot be used to meet the graduation requirement in biology: BI304 Biophysics, BI305 Bioethics, and BI307 Science of the Mind.)

Placement

An incoming student who has had little or no previous high school biology will enroll in BI105 Cellular Basis of Life and Heredity. Students who have had a year of high school biology before coming to the North Carolina School of Science and Mathematics usually enroll in a 200 level course.

Course Offerings

BI105 CELLULAR BASIS OF LIFE AND HEREDITY. One semester (1/2 unit of credit).

This course examines the molecular bases of cell structure and function and energy transformations in cells. Cell reproduction, Mendelian genetics, molecular genetics, and human genetics are studied in the second half of the course. Students use a variety of learning techniques during the semester. Enrichment activities such as computer simulations and field trips supplement the course material. Laboratory work is a major emphasis throughout the course.

BI205 CELL BIOLOGY AND BIOCHEMISTRY. One semester (1/2 unit of credit).

Prerequisite: High school course in introductory chemistry

This course examines cellular structure and function common to most eucaryotic cells. Topics covered include cellular components, cell movement and membrane function, energetics, protein synthesis, and enzyme function. In the second half of the course basic biochemical principles of carbohydrates, lipids, and proteins are explored. Students are expected to extend these principles to group projects.

BI208 ANATOMY AND PHYSIOLOGY. One semester (1/2 unit of credit).

This course focuses on the structure and function of the systems of the human body. Topics of study include cells, tissues, organs, and organ systems. Dissection is a part of the anatomy laboratory work. Students also perform a variety of physiology experiments as part of the study of each system. Field trips and speakers supplement the course.

BI212 HUMAN PHYSIOLOGY. One semester (1/2 unit of credit).

Prerequisite: BI205 Cell Biology and Biochemistry or BI208 Anatomy and Physiology or permission of the instructor

This course is an extension of the basic concepts and principles presented in BI205 Cell Biology and Biochemistry and BI208 Anatomy and Physiology. Emphasis is placed on practical applications of human physiology in areas such as cardiovascular physiology, neurophysiology, exercise physiology, nutrition in health and disease, and aging.. Laboratory activities are emphasized and students have access to physiological instrumentation. Field trips to examine biological technology and its relation to medicine supplement the class.

BI215 BEHAVIOR OF PLANTS AND ANIMALS. One semester (1/2 unit of credit).

Response to stimuli is a characteristic of all living things. These responses (behaviors) are examined as well as the physiology involved in the responses. Organisms as varied as protozoa, plants, and humans, and behaviors as varied as parenting, food-getting, and defense are studied.

BI221 GENETICS. One semester (1/2 unit of credit).

The course begins with the fundamentals of cell division. It then traces the development of genetics from the pea plants of Mendel, through the double helix model of Watson and Crick, to the current topics of gene regulation and recombinant genetics. Laboratory activities and critical thinking skills are heavily emphasized; students are expected to develop their own theories of gene regulation and design some of their own laboratory experiments. Field trips, videotapes, and outside speakers supplement the course.

BI224 EMBRYOLOGY AND EVOLUTION. One semester (1/2 unit of credit).

This course explores the development of vertebrates as individual organisms and as a subphylum. Fish, amphibians, and birds are used as specific examples of embryology. The evolution of all kinds of life is studied with particular emphasis on vertebrates and humans.

BI227 IMMUNOLOGY. One semester (1/2 unit of credit).

Prerequisite: BI221 Genetics or BI224 Embryology and Evolution or permission of the instructor

This course extends concepts from BI221 Genetics and BI224 Embryology and Evolution to study of the origin, development, and functioning of the immune response. Time is also given to recent advances in such fields as genetic predisposition to certain diseases, regulation of gene expression during development, developmental disorders of the immune system, and AIDS. Some laboratory time is spent on field trips to facilities that are performing research and making use of advances in these fields.

BI233 ECOLOGY. One semester (1/2 unit of credit).

This course covers concepts including population regulation, the "niche", competition, predation, ecological energetics, diversity, and biogeochemical cycles. Laboratory activities are used extensively to demonstrate and extend these concepts. Terrestrial and aquatic habitats are visited and studied. Students also use ecological concepts to study man's relationship to the environment and develop their own positions concerning several current environmental issues.

BI235 DEVELOPMENT, STRUCTURE AND FUNCTION OF HUMAN REPRODUCTIVE SYSTEMS. One semester (1/2 unit of credit).

In this course the anatomy of human reproductive systems is studied, together with their hormonal regulation. Modern technologies related to conception, pregnancy, and childbirth are examined. Laboratory activities are performed showing the development of several vertebrate embryos.

BI237 ORIGINS AND RESPONSES OF HUMAN REPRODUCTIVE SYSTEMS. One semester (1/2 unit of credit).

This course begins with a study of cellular reproduction, oogenesis, and spermatogenesis. Genetic determinants of gender and brain sex are studied. Other topics examined include mate selection, developmental abnormalities, and sexually transmitted diseases.

BI250 RESEARCH IN BIOLOGY. One year (1 unit of credit).

Prerequisite: Adequate score on biology placement examination and permission of the instructor

This course is designed to allow students to pursue individual research problems in biology. Students learn to use library resources, gain experience in scientific writing, receive supervised training in techniques commonly used in research, and receive instruction in laboratory safety and proper experimental design. Each student designs and carries out a research project under the supervision of the instructor. Students are encouraged to enter their projects in regional and national research competitions. This course is open to both juniors and seniors; juniors are particularly encouraged to enroll.

BI260 SURVEY OF ADVANCED BIOLOGY. One year (1 unit of credit).

Prerequisite: One year of biology or chemistry, taken at NCSSM, and permission of the instructor

This course is a survey of the field of biology. Lecture is kept to a minimum. Emphasis is placed on open-ended laboratory experiments and student involvement. Students who master content material will be prepared for the Biology Advanced Placement Examination.

BI304 BIOPHYSICS. One semester (1/2 unit of credit).

Prerequisite: One semester of biology; one semester of PH105 Physics or PH110 Physics and Topics

This course explores a variety of biological systems and questions from the point of view of physics. Examples are drawn from such areas as mechanics (bone and muscle strength and elasticity), the properties of fluids (air and blood circulation), electromagnetism (magnetism and bird navigation), and others. Biotechnological advances are discussed where relevant.

BI305 BIOETHICS. One semester (1/2 unit of credit; 1/4 each in biology and social science).

In this course students consider the ethical questions arising from discoveries of modern biology, including genetic counseling, genetic engineering, in vitro fertilization, medical research, transplants, euthanasia, and other issues.

BI307 SCIENCE OF THE MIND. One semester (1/2 unit of credit).

Prerequisite: One semester of biology and one year of chemistry or physics, all taken at NCSSM, or permission of the instructor

This is an interdisciplinary course that explores the biology, chemistry, and physics of the mind, as well as engineering applications such as artificial intelligence and neural network design. Topics include the anatomy and functional organization of the brain, memory and knowledge, emotion and motivation, sleep and dreaming, language and thought, information and meaning, and sensation and perception.

Chemistry

Graduation Requirement in Chemistry

The graduation requirement in chemistry may be fulfilled by a year of CH105 Chemistry, CH110 Chemistry and Topics, or CH210 Advanced Chemistry at the North Carolina School of Science and Mathematics. (Note: The following electives cannot be used to meet the graduation requirement in chemistry: CH305 Organic Chemistry, CH307 Environmental Chemistry, CH310 Chemical Instrumentation, CH315 Polymer Chemistry, CH320 Biochemistry, and CH325 Research in Chemistry.)

Placement

An incoming student who has had little or no previous chemistry usually enrolls in either CH105 Chemistry or CH110 Chemistry and Topics depending on the level of preparation in mathematics (see CH110 corequisite). Students who have taken a previous chemistry course take a test to ensure proper placement in CH105, CH110, or CH210.

An incoming student who has had a year of chemistry before coming to the North Carolina School of Science and Mathematics usually enrolls in CH210 Advanced Chemistry. Juniors enrolling in this course are given a test to ensure proper placement.

Course Offerings

CH105 CHEMISTRY. One year (1 unit of credit).

This course provides a thorough treatment of chemical principles. Although it covers the so-called "basic" concepts (atomic theory, chemical bonding, molecular structure, thermodynamics, kinetic theory, chemical equilibrium, etc.), the course is more rigorous and complete than most high school general chemistry courses. However, it does not require advanced placement in mathematics.

CH110 CHEMISTRY AND TOPICS. One year (1 unit of credit).

Prerequisite: Algebra 2

Corequisite: MA120 Contemporary Precalculus through Applications or higher mathematics

This course, like CH105 Chemistry, covers the so-called "basic" concepts of chemistry in a rigorous way, but it uses a college-level textbook and moves at a faster pace than CH105, thereby covering additional topics and treating many areas in greater depth. A student who performs very well in this course is adequately prepared for the Advanced Placement Chemistry Examination.

CH210 ADVANCED CHEMISTRY. One year (1 unit of credit).

Prerequisite: CH105 Chemistry or CH110 Chemistry and Topics or permission of the instructor

This course is designed for students who have already mastered the basic concepts of chemistry. A college-level textbook is used. Basic principles are reviewed, extended, and applied to more complex situations and advanced topics. It is especially recommended for those who wish to prepare for the Advanced Placement Chemistry Examination.

CH305 ORGANIC CHEMISTRY. One semester (1/2 unit of credit).

Prerequisite: CH105 Chemistry or higher chemistry and permission of the instructor

This course introduces topics on the structure and synthesis of organic compounds. Special emphasis is given to biologically important organic compounds. The laboratory involves isolation, analytical, and synthetic techniques. Instrumental techniques such as infrared and nuclear magnetic resonance spectrometry are used.

CH307 ENVIRONMENTAL CHEMISTRY. One semester (1/2 unit of credit).

Prerequisite: CH105 Chemistry or higher chemistry and permission of the instructor

This course introduces chemistry-related topics of environmental concern including atmospheric chemistry, acid rain, the chemistry of natural water systems, water pollution, and water treatment. Laboratory activities include field and sampling trips and analytical methods for monitoring pollutants.

CH310 CHEMICAL INSTRUMENTATION. One semester (1/2 unit of credit).

Prerequisite: CH105 Chemistry or higher chemistry and permission of the instructor

Corequisite: MA120 Contemporary Precalculus through Applications or higher mathematics

This course introduces students to several instrumental methods used to make measurements on chemical systems. Classroom presentation and discussion of the fundamental principles underlying each instrumental measurement is followed by practical laboratory experience using those instruments. Methods for which instruments are currently available include chromatographic separations (e.g., gas-liquid partition chromatography), ultraviolet-visible spectrophotometry, and electrochemistry.

CH315 POLYMER CHEMISTRY. One semester (1/2 unit of credit).

Prerequisite: CH105 Chemistry or higher chemistry and permission of the instructor

This course is an introduction to polymer science. The scope includes coverage of fundamental principles of bonding as related to macromolecules and important structure-property relationships. Laboratory work includes polymer modification, synthesis, infrared identification, film preparation, heat molding of thermoplastics, and embedding in commercial and lab-prepared synthetic resins (both thermoplastic and thermoset).

CH320 BIOCHEMISTRY. One semester (1/2 unit of credit).

Prerequisite: CH105 Chemistry or higher chemistry and permission of the instructor

This is a course intended to acquaint the student with the chemistry of biomolecules and metabolic pathways. Biomolecules considered include water, amino acids, peptides, proteins, enzymes, carbohydrates, lipids, vitamins, and coenzymes. Metabolic pathways presented include a survey of intermediary metabolism, glycolysis, uric acid cycle, electron transport, and oxidation of fatty acids.

CH325 RESEARCH IN CHEMISTRY. One year (1 unit of credit).

Prerequisite: One year of chemistry, adequate score on placement examination, and permission of the instructor

This course allows the students to pursue individual research problems in chemistry. Students learn to use library resources, gain experience in scientific writing, receive supervised training in techniques used in research, and receive instruction in laboratory safety and proper experimental design. Each student designs and conducts a research project. Students are encouraged to enter their projects in regional and national research competitions. This course is open to both juniors and seniors.

Physics

Graduation Requirement in Physics

The graduation requirement in physics may be fulfilled by a year of PH105 Physics, PH110 Physics and Topics, or PH210 Advanced Physics - Mechanics and PH211 Advanced Physics - Electromagnetic Theory at the North Carolina School of Science and Mathematics. (Note: The following electives cannot be used to meet the graduation requirement in physics: PH315 Applied Electronics, PH320 Musical Acoustics, PH325 Astrophysics, PH330 Solar System, or PH345 Advanced Modern Physics.)

Placement

An incoming student who has had little or no previous physics enrolls in PH105 Physics or PH110 Physics and Topics depending on the level of preparation in mathematics and science.

Students who have had a year of physics before coming to the North Carolina School of Science and Mathematics and who want to enroll in PH210 Advanced Physics - Mechanics may do so with permission of the physics faculty.

Course Offerings

PH105 PHYSICS. One year (1 unit of credit).

This course provides a sound algebra-based foundation in the principles of classical physics. The first semester covers the laws of mechanics and their applications. The second semester covers wave motion and the laws of electricity and magnetism. Throughout both semesters, topics in modern physics are included where appropriate.

PH110 PHYSICS AND TOPICS. One year (1 unit of credit).

Corequisite: MA120 Contemporary Precalculus through Applications or higher mathematics

This course covers the topics of PH105 Physics but in greater depth and at a faster pace. It has a greater mathematical emphasis than PH105 and uses a more advanced text.

PH210 ADVANCED PHYSICS - MECHANICS. One semester (1/2 unit of credit).

Prerequisite: PH105 Physics or PH110 Physics and Topics or permission of the instructor

Corequisite: MA317 Calculus of a Single Variable 1 or higher mathematics

This course is designed for students who have an excellent grasp of the fundamental concepts taught in PH105 Physics or PH110 Physics and Topics as reflected by the grade received in that course or on the physics exemption examination. It provides a rigorous treatment of classical mechanics for students who have a familiarity with the concepts of mechanics from an earlier course. Calculus is used where appropriate in problem solving and derivations. When time permits, other topics may also be covered, chosen from Lagrangian dynamics, heat and thermodynamics, fluid dynamics, and relativity. This course may be used to prepare for the Mechanics portion of the Advanced Placement Physics C examination.

PH211 ADVANCED PHYSICS - ELECTROMAGNETIC THEORY.
One semester (1/2 unit of credit).

Prerequisite: PH210 Advanced Physics - Mechanics or permission of the instructor

Corequisite: MA317 Calculus of a Single Variable 1 or higher mathematics

This course provides an introduction to the theory of electromagnetism as synthesized by Maxwell. Topics include Gauss's Law, conservative fields, electric circuits, Ampere's Law, electromagnetic induction, electromagnetic devices, and Maxwell's equations. Calculus is used where appropriate in problem solving and derivations, and the necessary vector calculus is introduced to allow understanding and use of Maxwell's equations. When time permits, other topics may also be covered, chosen from optics, wave motion, and quantum mechanics. This course may be used to prepare for the Electricity and Magnetism portion of the Advanced Placement Physics C examination.

PH315 APPLIED ELECTRONICS. One semester (1/2 unit of credit).

The emphasis of this course is on the practical application of electronics. Students begin by learning about basic electronic circuits and then use solderless breadboards to build and use these circuits in a variety of ways. The course is graded Satisfactory/Unsatisfactory.

PH320 MUSICAL ACOUSTICS. One semester (1/2 unit of credit).

This course provides an introduction to the physics of sound production and perception. Applications to music are emphasized. Topics include wave motion, resonating systems, perception and measurement of sound, production of sound by musical instruments and the human voice, room acoustics, and electronic sound reproduction. Some knowledge of either physics or music is helpful but is not required.

PH325 ASTROPHYSICS. One semester (1/2 unit of credit).

Corequisite: PH105 Physics or PH110 Physics and Topics; MA120 Contemporary Precalculus through Applications or higher mathematics

This course emphasizes the origin, structure, and evolution of stars, interstellar matter, galaxies, and the universe. Many physical and chemical principles are integrated into the study of both stellar and galactic structure and evolution. Opportunities for telescope observation and projects are available.

PH330 SOLAR SYSTEM. One semester (1/2 unit of credit).

Corequisite: PH105 Physics or PH110 Physics and Topics

This course emphasizes the origin, structure, and evolution of the solar system and its contents, including planets, moons, comets, asteroids, and meteors. Other topics of discussion include time and sundials, the origin of life on earth, and the possible existence of nature and life elsewhere in the universe. Opportunities for telescope observation and projects are available.

PH345 ADVANCED MODERN PHYSICS. One semester (1/2 unit of credit).

Prerequisite: PH105 Physics or PH110 Physics and Topics or permission of the instructor

Corequisite: MA317 Calculus of a Single Variable 1 or higher mathematics

This course surveys the physics developed during this century. Topics are selected from special and general relativity, atomic and nuclear structure, particle-wave duality, quantum mechanics, elementary particles, and grand unified theories. Use is made of calculus derivations for several classical physics models: the quantum mechanical Schroedinger solution for the particle-in-the-box problem, the harmonic oscillator, and electron probability distributions for the hydrogen atom.

Note: See also in Biology the course description of BI304 Biophysics which grants 1/4 unit of credit in physics.

DEPARTMENT OF HUMANITIES

The course offerings in the Department of Humanities attempt to sharpen students' decision-making and communications skills, enlarge students' understanding of their own culture and other cultures, and increase their appreciation of major art forms in an intellectual and applied context. The Department offers each student an opportunity to select from a variety of required and elective courses.

Art

Course Offerings

AR105 ART APPLICATIONS. One semester (1/2 unit of credit).

This course exposes students to four valuable art skills in one semester. Drawing in pencil and pen & ink introduces students to concepts of right brain stimulation, seeing and analyzing reality, and interpreting reality by using abstract expression to respond to their personal feelings. All sections of the course start out with this foundation and then proceed to a varying sequence of three more skills: screenprinting, photography, and ceramics.

AR110 MECHANICAL DRAWING. One semester (1/2 unit of credit).

This course provides in-depth training in drawing to students considering careers in engineering and architecture and for those students desiring ways to make themselves more effective in visually communicating technical information in any profession. The goal of this individually paced course is to master engineering and technical drawing tools. Computer-aided design is made available to those wishing to pursue independent work.

AR202 ADVANCED ART APPLICATIONS. One semester (1/2 unit of credit).

Prerequisite: AR105 Art Applications

This course is designed to give students the opportunity to build upon skills and techniques learned in Art Applications. Students complete units on drawing using pen & ink, charcoal and pastels; acrylic painting; multi-color and photographic printmaking; photography; and ceramics. The final unit of this course is an independent project, with each student deciding the medium from the processes previously used in class.

AR205 ADVANCED PHOTOGRAPHY. One semester (1/2 unit of credit).

Prerequisite: Prior photography experience; AR105 Art Applications strongly recommended

This course is designed to provide the experienced photographer with advanced darkroom, studio, and in-the-field skills. Color photography is introduced. Class begins with formal instruction and evolves toward independent student work.

AR210 ADVANCED MECHANICAL DRAWING. One semester (1/2 unit of credit).

Prerequisite: AR110 Mechanical Drawing

This advanced course emphasizes product design, assembly drawing, and exploded views. Architectural drafting is introduced with emphasis on floor plans, site plans, elevations, perspective drawing, exterior and interior building details, and the development of a personal lettering style. The final project is an original design of a building, space, or functional object complete with all drawings necessary for its construction. Students learn the basics of computer-aided design through the use of AutoCAD software.

English

Junior English: Juniors are required to enroll in EN105 Writing and American Literature.

Senior English: Each student is required to earn 1/2 unit of credit in English during each semester of the senior year. In at least one of these semesters the student must be enrolled in a literature course.

Course Offerings

EN105 WRITING AND AMERICAN LITERATURE. One year (1 unit of credit).

This course provides students with the opportunity to develop writing skills while studying major works of American literature. The writing study seeks to develop and enhance skills of communication and expression of ideas. The literary study focuses on the uniquely American characteristics of these works, their larger thematic implications, and their artistic merit.

EN205 BRITISH LITERATURE. One semester (1/2 unit of credit).

Students survey the literature of England from its beginning to 1600. Students continue to develop and practice skills in composition and rhetoric introduced in the junior year through various analytical, expository, appreciative, and creative assignments.

EN206 BRITISH LITERATURE. One semester (1/2 unit of credit).

This course is a survey of the literature of England from 1600 to the present. Special attention is given to major writers and to works of each period. Students continue to develop and practice skills in composition and rhetoric introduced in the junior year through various analytical, expository, appreciative, and creative assignments.

EN210 ADVANCED WRITING. One semester (1/2 unit of credit).

In this course students continue to study examples of expository, argumentative, technical, and creative writing. Students are expected to produce work in several of these types and are encouraged to do additional work in those areas which most interest them.

EN305 WISDOM, REVELATION, REASON, AND DOUBT. Interdisciplinary one-semester, one-credit course for seniors (1/2 unit of credit in English; 1/2 unit of credit in social science).

This course integrates the political, cultural, social, and intellectual history of the ancient, classical, and medieval Western World with the study of literature and the visual arts. Students read, discuss, and write about literary and historical materials.

EN306 WISDOM, REVELATION, REASON, AND DOUBT. Interdisciplinary one-semester, one-credit course for seniors (1/2 unit of credit in English; 1/2 unit of credit in social science).

This course integrates the political, cultural, social and intellectual history of the modern Western World from the Renaissance with the study of literature and the visual arts. Students read, discuss, and write about literary and historical materials.

EN310 AFRICA AND LATIN AMERICA: LITERATURE AND HISTORY.

Interdisciplinary one-semester, one-credit course for seniors (1/2 unit of credit in English; 1/2 unit of credit in social science).

In this course students examine the history and literature of selected countries in both Africa and Latin America. The course focuses primarily on contemporary writers and on twentieth-century history. The course also acquaints students with the cultures of the areas covered.

EN311 ASIA AND THE MIDDLE EAST: LITERATURE AND HISTORY.

Interdisciplinary one-semester, one-credit course for seniors (1/2 unit of credit in English; 1/2 unit of credit in social science).

In this course students examine the history and literature of selected countries in the Middle East and Asia. The course focuses primarily on contemporary writers and on twentieth-century history. The course also acquaints students with the cultures of the areas covered.

EN315 TOPICS IN LITERATURE. One semester (1/2 unit of credit).

Students participate in a series of intensive, small-group studies, each emphasizing a major genre or period. Enrollment is limited to twenty seniors, recommended by their first-semester senior English instructors for an aptitude toward independent work.

Foreign Languages

Every student must enroll in a foreign language during the junior year. Any student who begins a new foreign language in the junior year must continue that language in the senior year, regardless of prior foreign language credits.

Course Offerings

FR105 INTRODUCTORY FRENCH. One year (1 unit of credit).

Emphasis in this course is placed on the acquisition of basic language skills: speaking, listening, comprehension, reading, and writing. The student acquires a base vocabulary and learns the simple grammatical constructions needed for essential communication. Cultural aspects of the people are also introduced.

FR205 INTERMEDIATE FRENCH. One year (1 unit of credit).

Prerequisite: One year of prior study of French

While emphasis on basic language skills is continued, the student's competency in the language is further increased by (1) reading short texts, (2) oral discussion of material read by the class, (3) greater use of the language in everyday conversational situations, and (4) creative expression which may take the form of written compositions, and short skits. Most of the grammatical constructions are learned.

FR305 ADVANCED FRENCH. One year (1 unit of credit).

Prerequisite: Two years of prior study of French

This course continues development and refinement of skills in oral, written, and aural French. The fine points of grammar, complex verb tenses, and idiomatic expressions are treated in depth, with emphasis on using these structures in composition and conversation. Le Petit Prince and a variety of literary excerpts are read and combined with culture units on French-speaking countries.

FR405 ADVANCED FRENCH LITERATURE. One year (1 unit of credit).

Prerequisite: Three years of prior study of French

This course, conducted entirely in French, examines French literary masterpieces in a variety of genres and periods as well as occasional articles from current French periodicals. Students are expected to acquire skills in French literary analysis, discussion, and composition. Audio and video tapes are also used to perfect speaking and listening skills and to increase students' understanding of contemporary culture in France and other Francophone countries.

GE105 INTRODUCTORY GERMAN. One year (1 unit of credit).

Emphasis in this course is placed on the acquisition of basic language skills: speaking, listening, comprehension, reading, and writing. The student acquires a base vocabulary and learns the simple grammatical constructions needed for essential communication. German culture is also introduced. Computer drills are available to aid students in the acquisition of grammatical concepts and new vocabulary.

GE205 INTERMEDIATE GERMAN. One year (1 unit of credit).

Prerequisite: One year of prior study of German

Emphasis on basic language skills is continued. The student's competency in the language is further increased by the reading and discussion of short texts. More complex grammatical constructions are learned and practiced. Computer drills are available to aid students in the acquisition of grammatical concepts and new vocabulary.

GE305 ADVANCED GERMAN. One year (1 unit of credit).

Prerequisite: Two years of prior study of German

The student continues development of skills in oral, aural, and written German. A systematic review of grammar is conducted with emphasis placed on the fine points not covered in the first two year of study of the language. Reading modern short stories, poems, and one full-length play serves as an introduction to German literature, and frequent compositions require students to synthesize what they have learned. Audio and video tapes and films aid in advancing listening comprehension skills as well as providing information on German culture.

LA105 INTRODUCTORY LATIN. One year (1 unit of credit).

Students gain mastery of the essentials of Latin grammar, with particular emphasis on English derivatives and vocabulary building. Cultural aspects of the Greek and Roman world are also introduced. Attention is given to development of translation skills. Computer drills are available to aid students in the acquisition of grammatical concepts and new vocabulary.

LA205 INTERMEDIATE LATIN. One year (1 unit of credit).

Prerequisite: One year of prior study of Latin

Review and further study of the essentials of Latin grammar are stressed. Increased emphasis is placed on reading and translation of ancient authors (Petronius, Caesar) and on English vocabulary and stylistics. Elements of Roman history are also introduced.

LA305 ADVANCED LATIN PROSE. One year (1 unit of credit).

Prerequisite: Two years of prior study of Latin

A systematic review of all Latin grammar is conducted. Emphasis is on reading and analyzing classical authors (Cicero, Pliny, Plautus) and their cultural environment. Students are introduced to supplementary areas of classical studies (religion, art, and history, among others). (Offered in 1991-92.)

LA307 ADVANCED LATIN POETRY. One year (1 unit of credit).

Prerequisite: Two years of prior study of Latin

A systematic review of all Latin grammar is conducted, and students are introduced to Latin poetry. Emphasis in the course is on reading and analyzing fables from Phaedrus, poems from Catullus and Horace, excerpts from the Metamorphoses of Ovid, and the Aeneid of Vergil. Basics of Latin scansion are studied. (Offered in 1990-91.)

RU105 INTRODUCTORY RUSSIAN. One year (1 unit of credit).

This course is an introduction to the Russian language with emphasis on conversation, reading, writing, and acquisition of the basic grammatical constructions. Computer drills are available to aid students in the acquisition of grammatical concepts and new vocabulary.

RU205 INTERMEDIATE RUSSIAN. One year (1 unit of credit).

Prerequisite: One year of prior study of Russian

In this course students continue acquisition of the basic grammatical elements of the language with increased emphasis on vocabulary building and oral self-expression. Filmstrips are used for cultural enrichment and aural comprehension. Computer drills are available to aid students in the acquisition of grammatical concepts and new vocabulary.

SP105 INTRODUCTORY SPANISH. One year (1 unit of credit).

Emphasis in this course is placed on the acquisition of basic language skills: speaking, listening, comprehension, reading, and writing. The student acquires a base vocabulary and learns the simple grammatical constructions needed for essential communication. Cultural aspects of the people are also introduced. Computer drills are available to aid students in the acquisition of grammatical concepts and new vocabulary.

SP205 INTERMEDIATE SPANISH. One year (1 unit of credit).

Prerequisite: One year of prior study of Spanish

While emphasis on basic skills is continued, the student's competency in the language is further increased by (1) reading short texts, (2) greater use of the language in everyday conversational situations, (3) oral discussion of material read by the class, and (4) creative expression which may take the form of written compositions, oral reports, and short skits. Most of the grammatical constructions are learned. Computer drills are available to aid students in the acquisition of grammatical concepts and new vocabulary.

SP305 ADVANCED SPANISH. One year (1 unit of credit).

Prerequisite: Two years of prior study of Spanish

This course, conducted in Spanish, is built around reading selections of varying degrees of difficulty. Designed to introduce certain basic aspects of Hispanic culture, the course also develops students' skills in becoming faster, more competent readers of Spanish. The more complex grammatical constructions of the language are studied and utilized in regular composition and conversational activities.

SP405 ADVANCED HISPANIC LITERATURE. One year (1 unit of credit).

Prerequisite: Three years of prior study of Spanish

This advanced-level course, conducted exclusively in Spanish, helps students develop a perceptive awareness and understanding of contemporary Hispanic culture through selected readings. The readings themselves, all works of major Hispanic writers, focus on issues in various communities of present-day Latin America. The selections represent a variety of genres and employ as an organizing theme the dynamics between tradition and innovation in Latin America today.

History and Social Sciences

Junior requirement: Each junior is required to register for SS105 American History: Critical Issues in order to complete one full unit of graduation credit.

Course Offerings

SS105 AMERICAN HISTORY: CRITICAL ISSUES. One year (1 unit of credit).

This course examines critical interpretive issues in American history from the Colonial Era to the present. The rigorous approach combines a narrative chronology of American development with an in-depth examination of ongoing problem areas in American life such as race relations, war and society, reform movements, the importance of ideas, government intervention in individual lives, and the nature of the modern political economy.

SS205 ECONOMICS: MONEY, MANAGEMENT, AND MARKETS. One semester (1/2 unit of credit).

Corequisite: MA120 Contemporary Precalculus through Applications or higher mathematics

This course in economics provides students a significant opportunity to apply the techniques and learnings of mathematics and science to social problems. The course is a study of theories and institutions that organize and direct the economic activities of mankind. It is designed to help students understand basic economics and the problems on which they will have to pass judgment.

SS210 WORLD RELIGIONS. One semester (1/2 unit of credit).

This course examines the major religions of the world, their historical roots, course of development, and present status. Emphasis is placed on the influence of each religion on modern thought, culture, and politics as well as its interface with philosophy.

SS215 THE DISCOVERERS: PEOPLE WHO CHANGED THE WORLD.
One semester (1/2 unit of credit).

This course chronicles the evolution of technology and its related scientific principles. Each major development, whether extraordinary advance or disastrous setback, is considered within its broader social context.

SS220 PSYCHOLOGY. One semester (1/2 unit of credit).

This course deals with man as an individual and as a member of society. Emphasis is placed on such areas as the development of personality, abnormal behavior, intellect vs. intelligence, learning styles, socialization, social systems, and social interaction.

SS225 INTERNATIONAL RELATIONS. One semester (1/2 unit of credit).

This course examines the political, economic, and social interactions in the post World War II era among the nations of Europe, Africa, Asia, Latin America, the Middle East, and North America. This course focuses on crisis points with attention to historical antecedents.

SS230 TOPICS IN HISTORICAL RESEARCH: AMERICAN WOMEN—A MULTICULTURAL PERSPECTIVE. One semester (1/2 unit of credit).

This senior level course offers students the opportunity to pursue directed study on a significant historical theme or era to be selected annually. Instruction will incorporate extensive discussion and interaction with the entire NCSSM Social Science faculty along with guest lecturers from the local university community.

SS235 INTRODUCTION TO PHILOSOPHY. One semester (1/2 unit of credit).

This course examines some perennial problems in philosophy including the nature and destiny of man, free will versus determinism, theories of knowledge, the nature of politics, ethical decision-making, loss of meaning, and death. Students read selected works from classical philosophers such as Plato, Aristotle, Descartes, Locke, Hume, Kant, Sartre, and Kierkegaard.

See also the following courses which grant credit in social science:

BI305 BIOETHICS. One semester (1/2 unit of credit; 1/4 each in biology and social science). See course description in Biology.

EN305 and 306 WISDOM, REVELATION, REASON, AND DOUBT. One-semester, one-credit courses for seniors (1 unit of credit; 1/2 each in English and social science). See course description in English.

EN310 AFRICA AND LATIN AMERICA: LITERATURE AND HISTORY.
EN311 ASIA AND THE MIDDLE EAST: LITERATURE AND HISTORY.
One-semester, one-credit courses for seniors (1 unit of credit; 1/2 each in English and social science). See course descriptions in English.

Music

Musical Performance: The following musical ensembles offer students the opportunity to study music through the medium of performance. Performance is seen not as an end in itself but as a means of developing an understanding of important ideas of music found in the repertoire of musical literature in a variety of historical periods and styles.

Ensembles

MU105 MIXED CHORUS. One semester (1/2 unit of credit.)
MU106 MIXED CHORUS. One semester (1/2 unit of credit.)

Prerequisite: No previous musical experience necessary

MU110 CONCERT BAND. One semester (1/2 unit of credit.)
MU111 CONCERT BAND. One semester (1/2 unit of credit.)

Prerequisite: Previous instrumental study or ensemble experience

MU115 ORCHESTRA. One semester (1/2 unit of credit.)
MU116 ORCHESTRA. One semester (1/2 unit of credit.)

Prerequisite: For string players: Previous instrumental study
For woodwind, brass, and percussion players: Permission of instructor and previous band or orchestra experience

MU120 JAZZ ENSEMBLE. One semester (1/2 unit of credit.)
MU121 JAZZ ENSEMBLE. One semester (1/2 unit of credit.)

Prerequisite: Previous instrumental, keyboard, or vocal performance experience; audition and permission of the instructor

Course Offerings

MU125 INTRODUCTION TO ELECTRONIC MUSIC. One semester (1/2 unit of credit).

Prerequisite: None; open to all students regardless of musical background

The purpose of this course is to provide an understanding of contemporary trends of electronic music through the media of musical performance, composition, and musical engineering. Although early electronic music was an experimental attempt to use new and unusual sounds, modern electronic music pervades the music industry of film scores, commercial music, and popular styles. The course includes the development of basic knowledge and skills of synthesizer performance, audio engineering and musical composition, and the study of the philosophical foundations of electronic music.

MU225 ADVANCED ELECTRONIC MUSIC. One semester (1/2 unit of credit).

Prerequisite: MU125 Introduction to Electronic Music or permission of the instructor

This course is essentially a continuation of MU125 Introduction to Electronic Music, with particular emphasis on musical composition, the development of musical performance skills, and the use of digital sequencers.

Media Center

Course Offerings

MC105 VIDEO PRODUCTION. One semester (1/2 unit of credit).

This course focuses on the main areas of production and post production: scripting/ storyboarding, producing, and editing. Students develop a technical vocabulary, learn to use the equipment, and produce two video programs.

MC205 ADVANCED VIDEO PRODUCTION. One semester (1/2 unit of credit).

This course is essentially a continuation of MC105 Video Production, with particular emphasis on editing, communication skills, and computer graphics.

STUDY OPTIONS AND MENTORSHIP

INDIVIDUALIZED STUDY

Prerequisite: Approval by the instructor of the course, department head, and Principal. Elective credit OR discipline graduation credit.

Individualized Study is a contract between student and teacher which allows students to move at their own pace and style through a course offered in the regular curriculum.

Grading: A, B, C, D or S, U as established in the regular course.

INDEPENDENT STUDY

Prerequisite: Approval of sponsoring member of the faculty, department head, and Principal. Elective credit.

Independent Study is available to any student who wishes to explore a topic or area of interest not offered in the regular curriculum. The student and the instructor together design the program of study and determine the number and frequency of meetings and the amount of credit to be earned. This option is available in all disciplines with the scope of the program left to the discretion of the instructor.

Grading: A, B, C, D or S, U as established at time of registration.

SEMINARS

Prerequisite: Approval of sponsoring member of the faculty, department head, and Principal. Elective credit.

Teams of three to eight students and a faculty sponsor meet at specified times to focus on a particular aspect of a discipline. Responsibility for reporting in sessions is shared interactively by students and sponsor.

Grading: A, B, C, D or S, U as established at time of registration.

ME105 MENTORSHIP PROGRAM. One year (1 unit of credit).

Prerequisite: Registration for the Mentorship Program (ME105) at the time of preregistration and approval of the Mentorship Program Coordinator. Elective credit.

Students spend three to five hours per week assisting professional researchers in area universities, institutions, and industries in the following fields: mathematics, science, engineering, and medicine. Pairing of researchers and students is arranged by a Mentorship Program Coordinator who also monitors the plan and objectives of the students' participation. A periodic evaluation is completed jointly by the mentor, the student, and the coordinator.

Grading: A, B, C, D

PHYSICAL ACTIVITY AND WELLNESS

Every junior is required to participate in the Physical Activity and Wellness Program. This independent study course (PA105) is designed to promote healthy lifestyles through individual exercise programs and self-paced learning modules. Students are required, both at the beginning of the junior year and at designated intervals throughout that year, to meet with the Physical Activity and Wellness instructors to design an appropriate program. Student progress in this course, which is a graduation requirement, is evaluated with a grade each quarter. Every student must complete this course by the end of the junior year.

Course Offering

PA105 PHYSICAL ACTIVITY AND WELLNESS. One year (1/2 unit of credit). Required of all juniors. See paragraph above.

MINIMUM GRADUATION REQUIREMENTS

Subject	Credits Earned at Previous School	Additional Credits Required by NCSSM	Total Credits
English	2	2	4
Mathematics	2	2	4
Science	1	3	4
Social Science	1	1	2
Foreign Language	0	2	2
or	1	1	2
or	2	1	3
Physical Activity and Wellness	1	0.5	1.5
Electives	1	1.5	2.5
TOTAL	8	12	20

Satisfactory participation as indicated by a final report grade of "S" in Community Service and Work Service, and demonstration of computer literacy are other requirements for graduation.

Special Notice

This catalog lists all of those courses which the School is prepared to offer. Since the total enrollment of the School is relatively small, it may not be possible to offer all courses every year. If the enrollment for a given course does not meet the minimum number required to justify faculty time, or if faculty resources are not available, the course may be canceled. In planning their course selections for elective courses, students should be prepared to consider alternative courses if their first choice is not available.

THE NORTH CAROLINA SCHOOL OF SCIENCE AND MATHEMATICS

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1991 - 1992

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